

CLAIMS

1. A process for bending glass sheets (2, 2.1) heated to their softening point, comprising the following features:
  - 5 - the glass sheets (2, 2.1) are laid on a concave bending frame (3, 3.1) and prebent by gravity,
  - the prebent glass sheets (2, 2.1) are transferred to a transfer former (4) with a concave forming surface, whose outside dimensions are smaller than those of the area enclosed by the concave bending frame (3, 3.1), by moving  
10 the transfer former (4) in a generally vertical relative movement through the concave bending frame (3, 3.1),
  - the transfer former (4) is positioned so that it vertically overlies a final bending former in the form of a  
15 frame (5) with a concave forming surface, the outside dimensions of the transfer former (4) once again being smaller than those of the area enclosed by the concave final bending former (5),
  - the transfer former (4) is moved in a generally vertical  
20 relative movement through the final bending former in the form of a frame (5), the glass sheets (2, 2.1) being laid on the final bending former (5),
  - the glass sheets (2, 2.1) are bent into their final shape, and
  - 25 - at the end of the bending operation, the glass sheets in their final shape (2, 2.1) are transferred from the final bending former (5) to a transport system and cooled.
2. The process as claimed in claim 1, characterized in that the glass sheets (2, 2.1) are put through an  
30 additional bending operation on the transfer former (4) by means of a differential pressure.
3. The process as claimed in claim 1 or 2, characterized in that the glass sheets (2, 2.1) are bent into their final shape on the final bending former (5) by  
35 gravity.
4. The process as claimed in claim 1 or 2, characterized in that the glass sheets (2, 2.1) are bent into their final shape using an upper former (6)

complementary in shape to the final bending former (5), which presses the glass sheets (2, 2.1) in at least their edge region onto the final bending former (5).

5           5.           The process as claimed in claim 4, characterized in that the press bending step is also assisted by a differential pressure.

6.           The process as claimed any one of the preceding claims, characterized in that individual glass sheets (2, 2.1) are bent.

10          7.           The process as claimed in claim 6, characterized in that following the final bending operation, the individual glass sheets (2, 2.1) are removed from the final bending former (5) on a toughening ring and toughened.

15          8.           The method as claimed in any one of claims 1 - 5, characterized in that several glass sheets placed on top of each other are bent.

20          9.           The method as claimed in claim 8, characterized in that the glass sheets placed on top of each other are, following the final bending operation, removed from the final bending former (5) on a cooling system and cooled to a temperature below the softening point.

25          10.          A system for bending glass sheets (2, 2.1) heated to their softening point, particularly for carrying out the process as claimed in any one of the preceding claims, in which the system comprises

- an oven for the heating the glass sheets (2, 2.1),
- a concave bending frame (3, 3.1) for carrying and prebending the heated glass sheets (2, 2.1),
- a transfer former (4) with a concave forming surface, whose perimeter is smaller than the perimeter of the bending frame (3, 3.1) and on which the glass sheets (2, 2.1) are transferred,
- a final bending former (5) with a concave forming surface, whose perimeter is greater than the perimeter of the transfer former (4), and to which the glass sheets (2, 2.1) are transferred from the transfer former (4),
- drive means for moving the bending frame (3, 3.1), the transfer former (4) and the final bending former (5) in the direction of the respective transfer of the glass sheets,

and

- means for transporting the glass sheets (2, 2.1), bent to their final shape, into a cooling station.

11. The system as claimed in claim 10, characterized  
5 in that the transfer former (4) is provided with a means for producing a depression between its forming surface and the glass sheets (2, 2.1).

12. The system as claimed in claim 11, characterized in that the transfer former (4) has a solid concave surface.

10 13. The system as claimed in any one of claims 10 - 12, characterized in that the system comprises an upper former (6) complementary in shape to the final bending former (5), which may be placed in contact with at least the edge regions of the glass sheets (2, 2.1) placed on the  
15 final bending former.

14. The system as claimed in claim 13, characterized in that the upper former (6) is provided with a means for producing a differential pressure between the forming surface of the upper former (6) and the upper surface of the  
20 glass sheets (2, 2.1).

15. The system as claimed in either of claims 13 and 14, characterized in that the upper former (6) has a solid convex surface.